National Institute of Environmental Health Sciences

Summer heat and mortality in New York City: How hot is too hot?

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Abstract:

BACKGROUND: To assess the public health risk of heat waves and to set criteria for alerts for -excessive heat, various meteorologic metrics and models are used in different jurisdictions, generally without systematic comparisons of alternatives. We report such an analysis for New York City that compared maximum heat index with alternative metrics in models to predict daily variation in warm-season natural-cause mortality from 1997 through 2006. MATERIALS and METHODS: We used Poisson time-series generalized linear models and generalized additive models to estimate weather-mortality relationships using various metrics, lag and averaging times, and functional forms and compared model fit. RESULTS: A model that included cubic functions of maximum heat index on the same and each of the previous 3 days provided the best fit, better than models using maximum, minimum, or average temperature, or spatial synoptic classification (SSC) of weather type. We found that goodness of fit and maximum heat index-mortality functions were similar using parametric and nonparametric models. Same-day maximum heat index was linearly related to mortality risk across its range. The slopes at lags of 1, 2, and 3 days were flat across moderate values but increased sharply between maximum heat index of 95 degrees F and 100 degrees F (35-38 degrees C). SSC or other meteorologic variables added to the maximum heat index model moderately improved goodness of fit, with slightly attenuated maximum heat index-mortality functions. CONCLUSIONS: In New York City, maximum heat index performed similarly to alternative and more complex metrics in estimating mortality risk during hot weather. The linear relationship supports issuing heat alerts in New York City when the heat index is forecast to exceed approximately 95-100 degrees F. Periodic city-specific analyses using recent data are recommended to evaluate public health risks from extreme heat.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831972

Resource Description

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal, Urban

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type:

format or standard characteristic of resource

Research Article

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale:

time period studied

Time Scale Unspecified